SkillsUSA and MSU-Northern Engine Endurance Testing Information Sheet

Building an engine that will run, for awhile, then self destruct in a dramatic way and do it **safely** is the challenge.

The test is to determine how long the engine will run (timed) and what happened to cause it to fail (failure analysis).

Engine endurance testing for SkillsUSA at MSU-Northern has evolved over the years. It began as a MSU-N SkillsUSA Club entertainment activity during the State Conference. The Automotive Program VS Diesel Program each built an engine and allowed it to self destruct by…

- ●Over speeding (gas engines)
- ●Over riding the governor (diesel engines)
- ●Other creative ideas that can be accomplished **safely.**
- ●The engines should be built with the maximum integrity possible. Engines should not be sabotaged to make them fail. For example, leaving one rod cap loose.

Gas engines are relatively easy to do and diesel engines are somewhat more challenging.

At the request of high school teachers, MSU-Northern has allowed high school teams to participate in the tests. High school students who have seen the testing during the State Conference may be quite motivated to participate.

Safety is the biggest concern.

1) At MSU-N the restricted area used for the tests is inside a chain link compound that separates the participants from the spectators.
2) MSU-N uses expanded metal or chain link cages to provide an additional barrier around the engines for flying parts.
3) Other teams must construct their engine with similar safety issues in mind. Remember the audience should be able to see the engine.
4) Team participants running the engine during the testing should be limited to 3.
   This reduces the number of individuals inside the restricted area.
   People inside the restricted area need to have coveralls, eye protection, hearing protection, gloves
5) MSU-N teams will have fire extinguishers, but bringing your own is advisable.
6) Teams need to bring their own tools, supplies, batteries, remote fuel supply, remote start, remote throttle (usually a cord to provide a 20 to 25 foot separation).
   MSU-Northern must approve the engine control setup prior to testing.
7) Exotic fuels such as ether, propane, nitrous oxide have been used in the past. However, the use of such fuels increases the safety factor.
   MSU-Northern must approve the use and setup of any fuel other than gasoline or diesel fuel prior to testing (see #6).

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